

ARTIFACT SHEET

Enter artifact number below. Artifact number is application number + artifact type code (see list below) + sequential letter (A, B, C . .). The first artifact folder for an artifact type receives the letter A, the second B, etc..
Examples: 59123456PA, 59123456PB, 59123456ZA, 59123456ZB

09234427 BA
Indicate quantity of a single type of artifact received but not scanned. Create individual artifact folder/box and artifact number for each Artifact Type.

☐

CD(s) containing:

computer program listing

Doc Code: Computer

pages of specification

and/or sequence listing

and/or table

Doc Code: Artifact

content unspecified or combined

Doc Code: Artifact

☐

Artifact Type Code: P

☐

Artifact Type Code: S

☐

Artifact Type Code: U

☐

Stapled Set(s) Color Documents or B/W Photographs

Doc Code: Artifact Artifact Type Code: C

☐

Microfilm(s)

Doc Code: Artifact Artifact Type Code: F

☐

Video tape(s)

Doc Code: Artifact Artifact Type Code: V

☐

Model(s)

Doc Code: Artifact Artifact Type Code: M

☒

Bound Document(s)

Doc Code: Artifact Artifact Type Code: B

☐

Confidential Information Disclosure Statement or Other Documents
marked Proprietary, Trade Secrets, Subject to Protective Order,
Material Submitted under MPEP 724.02, etc.

Doc Code: Artifact Artifact Type Code X

☐

Other, description: _____

Doc Code: Artifact Artifact Type Code: Z

The
United
States
of
America



The Commissioner of
Patents and Trademarks

Has received an application for a patent for a new and useful invention. The title and description of the invention are enclosed. The requirements of law have been complied with, and it has been determined that a patent on the invention shall be granted under the law.

Therefore, this

United States Patent

Grants to the person(s) having title to this patent the right to exclude others from making, using, offering for sale, or selling the invention throughout the United States of America or importing the invention into the United States of America for the term set forth below, subject to the payment of maintenance fees as provided by law.

If this application was filed prior to June 8, 1995, the term of this patent is the longer of seventeen years from the date of grant of this patent or twenty years from the earliest effective U.S. filing date of the application, subject to any statutory extension.

If this application was filed on or after June 8, 1995, the term of this patent is twenty years from the U.S. filing date, subject to any statutory extension. If the application contains a specific reference to an earlier filed application or applications under 35 U.S.C. 120, 121 or 365(c), the term of the patent is twenty years from the date on which the earliest application was filed, subject to any statutory extension.

Bence Lehman

Commissioner of Patents and Trademarks

Pandra Morton

Attest



US005630153A

United States Patent [19][11] **Patent Number:** **5,630,153****Intrater et al.**[45] **Date of Patent:** **May 13, 1997**

[54] **INTEGRATED DIGITAL SIGNAL
PROCESSOR/GENERAL PURPOSE CPU
WITH SHARED INTERNAL MEMORY**

FOREIGN PATENT DOCUMENTS

299537 1/1989 European Pat. Off. .

OTHER PUBLICATIONS

MCS 8080/8085 Family User's Manual, Intel 1986, 5-1-19.
MCS 80/85 Family User's Manual, Intel Corporation, 1986,
Chapter 5, The Instruction Set.

Electronic Design, Aug. 22, 1991, Microcontroller Eases
Closed-Loop Servo Control, Dave Bursky, pp. 119-121.

National Semiconductor, Jan. 1990, NS32FX16-15/
NS32FX-16-20/NS32FX16-25, High Performance FAX
Processor.

Electronic Engineering Times, Aug. 26, 1991.; Ron Wilson:
"Zilog Uses DSP for Disk Drive IC".

National Semiconductor, Jan. 11, 1989, KV96-X6D modem
chip set.

[75] **Inventors:** Amos Intrater, Lantau, Hong Kong;
Moshe Doron, Sunnyvale, Calif.;
Gideon Intrater, Ramat-Gan; Lev
Epstein, Holon, both of Israel; Maurice
Valentaten, Geldtendorf, Germany;
Israel Greiss, Raanana, Israel

[73] **Assignee:** National Semiconductor Corporation,
Santa Clara, Calif.

[21] **Appl. No.:** 317,783

[22] **Filed:** Oct. 4, 1994

Related U.S. Application Data

[63] Continuation of Ser. No. 11,102, Jan. 29, 1993, abandoned,
which is a continuation of Ser. No. 467,148, Jan. 18, 1990,
abandoned.

[51] **Int. Cl.⁶** G06F 9/26; G06F 9/40;
G06F 9/44; G06F 13/36

[52] **U.S. Cl.** 395/800; 395/290; 395/306;
364/DIG. 1; 364/DIG. 2

[58] **Field of Search** 395/800, 290,
395/200.01, 375, 200.03, 700, 289, 287,
297, 2.79, 183.19, 2.55, 775, 306; 364/DIG. 1,
DIG. 2, 706, 736, 726

[56] **References Cited**

U.S. PATENT DOCUMENTS

3,631,405	12/1971	Hoff et al.	395/650
4,276,594	6/1981	Morley	395/800
4,541,048	9/1985	Propster et al.	395/375
4,594,651	6/1986	Jaswa et al.	364/131
4,641,238	2/1987	Kneib	395/290
4,799,144	1/1989	Parruck et al.	364/200
4,811,345	3/1989	Johnson	395/183.03
4,860,191	8/1989	Nomura et al.	395/290

(List continued on next page.)

(List continued on next page.)

Primary Examiner—Daniel H. Pan

Attorney, Agent, or Firm—Limbach & Limbach L.L.P.

[57]

ABSTRACT

An integrated data processing platform for processing a digital signal that includes a general purpose processor and a digital signal processor (DSP) module. The DSP module recovers digital data from a digital signal utilizing a sequence of DSP operations selected by the general purpose processor. The general purpose processor processes the digital data recovered by the DSP module, but is also available to perform general purpose tasks. A shared internal memory array selectively provides information to the DSP module and to the general purpose processor. The information stored in the internal memory array includes operands utilized in the execution of the DSP algorithm and selected instructions and data utilized by the general purpose CPU either for controlling the execution of the DSP algorithm or for executing its own general purpose tasks. While in many applications the data processing system will include an analog front end that converts a modulated input signal received on an analog transmission channel to a corresponding digital signal for processing by the data processing system, the data processing system may also receive the digital signal directly from a digital source.

10 Claims, 8 Drawing Sheets